

JAPAN

EDICT OF GOVERNMENT

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JIS C 9335-2-4 (2004) (English): Household and similar electrical appliances -- Safety -- Part 2-4: Particular requirements for spin extractors

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*The citizens of a nation must
honor the laws of the land.*

Fukuzawa Yukichi

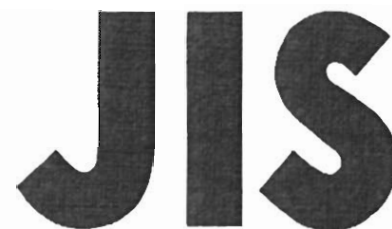
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JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS C 9335-2-4 : 2004
(JEMA)

**Household and similar electrical
appliances—Safety—
Part 2-4 : Particular requirements
for spin extractors**

ICS 13.120; 97.060

Reference number : JIS C 9335-2-4 : 2004 (E)

Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee, as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Electrical Manufacturer's Association (JEMA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14. Consequently **JIS C 9335-2-4 : 2000** is replaced with this Standard.

This revision has been made based on **IEC 60335-2-4 : 2002 *Household and similar electrical appliances—Safety—Part 2-4 : Particular requirements for spin extractors*** for the purposes of making it easier to compare this Standard with International Standard; to prepare Japanese Industrial Standard conforming with International Standard; and to propose a draft of an International Standard which is based on Japanese Industrial Standard. Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

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the original JIS is to be the final authority.

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Household and similar electrical appliances—Safety—Part 2-4 : Particular requirements for spin extractors

Introduction This Japanese Industrial Standard has been prepared based on IEC **60335-2-4** *Household and similar electrical appliances—Safety—Part 2-4 : Particular requirements for spin extractors* published in 2002 as the fifth edition with some modifications in the technical contents. This is to be read in conjunction with **JIS C 9335-1** : 2003 *Household and similar electrical appliances—Safety—Part 1 : General requirements*.

In this Standard, the portions underlined with dots are the matters modified from the original International Standard. The list of modifications is given in annex 1 (informative) with the explanation being attached.

1 Scope This Standard deals with the safety of electric spin extractors for household and similar purposes that have a capacity not exceeding 10 kg of dry cloth and a drum peripheral speed not exceeding 50 m/s, their rated voltages being not more than 250 V for single-phase appliances and 480 V for other appliances.

NOTE 101 Spin extractors incorporated in washing machines are within the scope of this Standard, irrespective of their capacity.

Appliances not intended for normal household use but which nevertheless may be a source of danger to the public, such as appliances intended to be used by laymen in shops, in light industry and on farms, are within the scope of this Standard.

NOTE 102 Examples of such appliances are spin extractors for communal use in blocks of flats or in launderettes.

As far as practicable, this Standard deals with the common hazards presented by appliances which are encountered by all persons in and around the home. However, in general, it does not take into account

- the use of appliances by young children or infirm persons without supervision;
- playing with the appliance by young children.

NOTE 103 Attention is drawn to the fact that

- for appliances intended to be used in vehicles or on board ships or aircraft, additional requirements may be necessary.
- in many countries additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour, the national water supply authorities and similar authorities.

NOTE 104 This Standard does not apply to

- appliances intended exclusively for industrial purposes;
- appliances intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas).

NOTE 105 The International Standard corresponding to this Standard is as follows.

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21**.

IEC 60335-2-4 : 2002 *Household and similar electrical appliances—Safety—Part 2-4 : Particular requirements for spin extractors* (MOD)

2 Normative references The normative references shall, in addition to those specified in clause 2 of **JIS C 9335-1**, be as follows:

JIS C 9811 *Electric clothes washing machines for household use—Methods for measuring the performance*

IEC 60436 *Methods for measuring the performance of electric dishwashers*

3 Definitions For the purpose of this Standard, in addition to the definitions specified in clause 3 of **JIS C 9335-1**, the definitions stated below shall apply. However, **3.1.9** shall be replaced as stated in this Standard.

3.1.9 Replacement:

normal operation operation of the appliance under the following conditions

The drum is filled with textile material having a mass in the dry condition equal to the maximum mass specified in the instructions. The textile material consists of pre-washed double hemmed cotton sheets having dimensions of approximately 70 cm × 70 cm and a specific mass between 140 g/m² and 175 g/m² in the dry condition. It is saturated with water before being evenly distributed in the drum.

NOTE 201 The test textile material may be the cloth specified in **JIS C 9811** having approximate dimensions of 91 cm × 91 cm and an unit mass of 100 g/m² ± 10 g/m² under dry condition.

3.101 Brake mechanism A system which brakes the drum and stops the rotation of drum when the external cover of a spin extractor is opened.

3.102 Double-lid structure Such a structure that the rotating axis of drum is vertical and it is necessary to open the two lids individually for access to the water extraction drum. The outer lid accessible during water extraction shall be such that it can not be opened during rotation of drum or the brake mechanism actuates when the lid is opened during rotation of drum. This lid is called the first lid. The lid which becomes accessible after opening of the first lid is called the second lid.

4 General requirement General requirement shall be as stated in clause 4 of **JIS C 9335-1**.

5 General conditions for the test General conditions for the tests shall be as stated in clause 5 of **JIS C 9335-1** except as follows.

5.3 Addition to 5.3 of JIS C 9335-1:

The test of **22.101** is carried out before the tests of clause **20**.

5.101 Spin extractors are tested as portable appliances, unless they are fixed appliances or are incorporated in another appliance.

6 Classification Classification shall be as stated in clause **6** of **JIS C 9335-1** except as follows.

6.1 Modification:

Appliances shall be class 0I, class I, class II or class III.

Compliance is checked visually or by associated tests.

6.2 Addition to 6.2 of JIS C 9335-1:

Appliances shall be at least IPX4.

7 Marking and instructions Marking and instruction shall be as stated in clause **7** of **JIS C 9335-1** except as follows.

7.10 Addition to 7.10 of JIS C 9335-1:

If the off position is only indicated by letters, the word "off" or the Japanese Kanji character denoting "off" shall be used.

7.12 Addition to 7.12 of JIS C 9335-1:

The instructions shall specify the maximum mass of dry cloth in kilograms, to be used in the appliance.

7.12.1 Addition to 7.12.1 of JIS C 9335-1:

If the label specified in **7.101** is supplied with the appliance, the installation instructions shall state that it has to be permanently fixed to the wall close to the appliance.

For appliances intended for communal use in blocks of flats, and having an interlock system that has to be energized in order to release the lid, the installation instructions shall state that a device for switching off the appliance automatically is not to be installed in the supply circuit.

7.101 Addition:

Appliances intended for communal use in blocks of flats, and having an interlock system that has to be energized in order to release the lid, shall be supplied with a label that states the substance of the following, unless the instruction is marked on the appliance.

This spin extractor has to be connected to the supply mains before the lid can be opened. Do not force it open.

8 Protection against access to live parts Protection against access to live parts shall be as stated in clause **8** of **JIS C 9335-1** except as follows.

8.1.1 Addition to 8.1.1 of JIS C 9335-1:

NOTE 201 For a spin extractor which also serves as a washing machine or which is build in a washing machine, the test shall be carried out without tilting provided that it is a stationary type and exceeds 40 kg when water of the maximum designed amount is filled in the washing drum.

9 Starting of motor-operated appliances Clause 9 of JIS C 9335-1 is not applicable.

10 Power input and current Power input and current shall be as stated in 10.4 of JIS C 9335-1.

11 Heating Heating shall be as stated in clause 11 of JIS C 9335-1 except as follows.

11.7 Replacement of 11.7 of JIS C 9335-1:

Appliances are operated for five periods of water extraction, the periods being separated by a rest period. Each rest period, which includes the braking time, has a duration of 1 min for each kilogram of dry textile material or 4 min, whichever is longer. During the rest period, the textile material is re-saturated with water.

For appliances incorporating a programmer or time, the water extraction period is the maximum allowed by the control.

For other appliances, the water extraction period has a duration of

- 15 min for continuous-flow rinsing appliances;
- 5 min for other appliances.

If a longer period is indicated in the instructions, this period applies instead.

NOTE 201 The cyclic temperature test of a spin extractor which also serves as a washing machine or which is build in a washing machine shall be made in accordance with 11.7 of JIS C 9335-2-7. However, the said test shall be made in accordance with this Standard when the maximum water extracting capacity stated in the instruction manual is smaller than the washing water extracting capacity.

12 Void

13 Leakage current and electric strength at operating temperature Leakage current and electric strength at operating temperature shall be as stated in clause 13 of JIS C 9335-1.

14 Transient overvoltages Transient overvoltages shall be as stated in clause 14 of JIS C 9335-1.

15 Moisture resistance Moisture resistance shall be as stated in clause 15 of JIS C 9335-1 except as follows.

15.2 Replacement:

Appliances shall be constructed so that spillage of liquid in normal use does not affect their electrical insulation.

Compliance is checked by the following tests.

Appliances with type X attachment, except those having a specially prepared cord, are fitted with the lightest permissible type of flexible cord and having the smallest cross-sectional area specified in table 13.

The inlet to the discharge pump or to the gravity drain is blocked. The drum is filled as specified for normal operation, the mass of water being twice the mass of the dry textile material. Any water remaining after the saturation process is poured into the appliance, which is supplied at rated voltage and operated for 1 min or the maximum period allowed by the programmer or time, whichever is shorter.

In addition, continuous-flow rinsing appliances having a vertical axis, are completely filled with saturated textile material and 10 L of water is poured in over a period of 20 s. The appliance is then operated while supplied at rated voltage.

For appliances having a working surface, controls are placed in the on position and 0.5 L of water containing approximately 1 % NaCl and 0.6 % of rinsing agent, as specified in annex AA, is poured over the top of the appliance. The controls are then operated through their working range, this operation being repeated after a period of 5 min.

The appliance shall then withstand the electric strength test of 16.3 and inspection shall show that there is no trace of water on insulation that could result in a reduction of clearances and creepage distances below the values specified in clause 29.

16 Leakage current and electric strength Leakage current and electric strength shall be as stated in clause 16 of JIS C 9335-1.

17 Overload protection of transformers and associated circuits Overload protection of transformers and associated circuits shall be as stated in clause 17 or JIS C 9335-1.

18 Endurance Endurance shall be as stated below.

Appliances having lids that can be opened while the drum is rotating shall be constructed so that braking mechanisms and lid interlocks withstand the stresses to which they may be exposed in normal use.

NOTE : This specification is applicable to appliances having braking mechanism only for compliance with 20.104.

Compliance is checked by the following test.

The appliance is supplied at rated voltage and operated under normal operation until the motor has reached its maximum speed.

The lid is then fully opened. The test is repeated after the drum has been at rest for a period long enough to ensure that the appliance does not attain an excessive temperature.

The test is carried out

- 6 000 times for appliances with maximum peripheral speed not exceeding 20 m/s;
- 10 000 times for appliances with maximum peripheral speed exceeding 20 m/s but not exceeding 30 m/s.

The textile material is re-saturated with water at least every 250 times.

After the test the appliance shall be fit for further use and compliance with this Standard, especially with clause 20 shall not be impaired.

NOTE : Forced cooling may be used to prevent excessive temperatures and to shorten the test.

19 Abnormal operation Abnormal operation shall be as stated in clause 19 of JIS C 9335-1 except as follows.

19.7 Not applicable.

19.9 Not applicable.

20 Stability and mechanical hazards Stability and mechanical hazards shall be as stated in clause 20 of JIS C 9335-1 except as follows.

20.1 Addition to 20.1 of JIS C 9335-1:

The drum is empty, or filled as specified for normal operation, whichever is more unfavourable.

20.101 Appliances shall not be adversely affected by an unbalanced load.

Compliance is checked by the following test.

The appliance is placed on a horizontal support and a load having a mass of 0.2 kg or 10 % of the maximum mass of textile material specified in the instructions, whichever is higher, is fixed to the inside wall of the drum half-way along its length.

The appliance is supplied at rated voltage and operated for 5 min or the maximum period allowed by a programmer or timer, whichever is shorter.

The test is carried out four times, the load being moved each time through an angle of 90° around the wall of the drum.

The appliance shall not overturn and the drum shall not hit other parts except the enclosure.

After the test, the appliance shall be fit for further use.

20.102 The lid or door shall be interlocked so that the appliance can only be operated when the lid or door is in the closed position.

Compliance is checked by inspection and by manual test.

NOTE : Interlocks that can be released by means of the test probe B of JIS C 0922 are not considered to meet this requirement.

20.103 For spin extractors, whether they are separate or incorporated in a washing machine with a separate drum for water extraction, having a drum with a kinetic energy exceeding 1 500 J or a maximum peripheral speed exceeding the value given below, it shall not be possible to open the lid while the drum is in motion.

- 30 m/s for spin extractors with vertical drum axis which has double-lid structure;
- 20 m/s for other spin extractors.

Compliance is checked by inspection, by measurement and by the following test.

The appliance is supplied at rated voltage and operated empty. The force determined during the test of **22.101** with the lid interlocked is applied to the lid in an attempt to open it.

It shall not be possible to open the lid while the drum is in motion.

NOTE 1 If the drum is not cylindrical, the peripheral speed is the mean peripheral speed.

NOTE 2 The kinetic energy is calculated from the following formula:

$$E = \frac{mv^2}{4}$$

where

E is the kinetic energy, in J;

m is the mass of the cloth specified in the instructions for use, in kilograms;

v is the maximum peripheral speed of the drum, in m/s.

20.104 For spin extractors, whether they are separate or incorporated in a washing machine with a separate drum for water extraction, having a drum with a kinetic energy not exceeding 1 500 J and a maximum peripheral speed not exceeding the value given below, moving parts shall not be accessible while the motor is energized or when the drum speed exceeds 60 rev/min.

- 30 m/s for spin extractors with vertical drum axis and double-lid structure;
- 20 m/s for other spin extractors.

The braking system shall not be affected by the penetration of water.

Compliance is checked by the following test, which is carried out after repeating the spillage test of **15.2**.

The appliance is supplied at rated voltage and operated empty. The lid is gradually opened and

- with an opening of 4 mm to 10 mm, it shall not be possible to touch parts rotating at a speed exceeding 60 rev/min with the test probe 12 of **JIS C 0922**;
- with an opening greater than 10 mm, but not more than 12 mm, it shall not be possible to touch parts rotating at a speed exceeding 60 rev/min with a test rod 3 mm in diameter and 120 mm long. In addition, the test probe B of **JIS C 0922** is applied and shall not come within a distance of 20 mm from the rotating parts;

- with an opening greater than 12 mm, the motor shall be disconnected from the supply and the drum speed shall not exceed 60 rev/min. This requirement does not apply to such appliances of double-lid structure that rotation of water extraction drum can be visually observed without opening the second lid. Further, appliances of double-lid structure having braking mechanism shall stop within the time given below when the first lid is completely opened during rotation at the maximum rotation speed. The appliance is operated at the rated voltage under normal operation stated in 3.1.9.
- 15 s, for appliances in which rotation of water extracting drum can be visually observed without opening of the second lid;
- 10 s, for other appliances.

20.105 For appliances in which water extraction takes place in the drum used for washing and in which the drum has a kinetic energy exceeding 1 500 J or a peripheral speed exceeding

- 20 m/s, for washing machines having a drum that rotates about the horizontal axis;
 - 40 m/s, for washing machines having a drum that rotates about the vertical axis;
- it shall not be possible to open the lid or door while the drum is in motion at a speed exceeding 60 rev/min.

Compliance is checked by the following test.

The appliance is supplied at rated voltage and operated empty. The force, determined during the test of 22.101 with the lid or door interlocked, is applied to the lid or door in an attempt to open it.

It shall not be possible to open the lid or door while the drum speed exceeds 60 rev/min.

20.106 Appliances in which water extraction takes place in the drum used for washing, and in which the drum has a kinetic energy not exceeding 1 500 J and a peripheral speed not exceeding

- 20 m/s, for washing machines having a drum that rotates about the horizontal axis;
 - 40 m/s, for washing machines having a drum that rotates about the vertical axis;
- shall be provided with an automatic means for reducing the drum speed to 60 rev/min when the lid or door is opened.

Compliance is checked by the following test.

The appliance is supplied at rated voltage and operated empty. A force not exceeding 50 N is applied to the lid or door in an attempt to open it as in normal use. If the lid or door opens, the drum speed shall be no higher than 60 rev/min within 7 s of opening the lid or door by 50 mm.

20.107 Protective devices fitted in the upper part of spin extractors having a vertical axis shall be positioned or protected so that the device is not likely to be damaged by textile material that may escape from the drum in normal use.

Compliance is checked by inspection.

21 Mechanical strength Mechanical strength shall be as stated in clause 21 of JIS C 9335-1 except as follows.

21.101 Lids of appliances shall have adequate mechanical strength.

Compliance is checked by the following test.

A rubber hemisphere having a diameter of 70 mm and a hardness between 40 IRHD and 50 IRHD is fixed to a cylinder having a mass of 20 kg and dropped from a height of 10 cm onto the centre of the lid.

The test is carried out three times, after which the lid shall not be damaged to the extent that moving parts become accessible.

However, in such a case that the lid is made of resin and a caution "not to give strong shock to the lid" is described in the instruction manual, the lid shall not be damaged to the extent that moving parts become accessible after application of static load to the centre of the lid by means of the said cylinder.

21.102 Lids and their hinges shall have adequate resistance to distortion.

Compliance is checked by the following test.

A force of 50 N is applied to the open lid in the most unfavourable direction and position.

The test is carried out three times, after which the hinges shall not have worked loose and the appliance shall not be damaged or deformed to such an extent that compliance with the appropriate requirements of 20.102 to 20.106 is impaired.

22 Construction Construction shall be as stated in clause 22 of JIS C 9335-1 except as follows.

22.101 Interlocks shall be constructed so that lids or doors are unlikely to be forced open in normal use.

Compliance is checked by the following test.

The lid or door is opened manually as in normal use, the force applied being measured. The lid or door is closed and interlocked. An attempt is then made to open the lid or door in the same way.

It shall not be possible to force open the lid or door with a force less than 10 times the value originally measured, with a minimum of 50 N.

NOTE : The test is not carried out if the interlock is not required for compliance with clause 20.

23 Internal wiring Internal wiring shall be as stated in clause 23 of JIS C 9335-1.

24 Components Components shall be as stated in clause 24 of JIS C 9335-1 except as follows.

24.1.4 Modification of **24.1.4** of **JIS C 9335-1**:

The number of cycles of operation for programmers is increased to 10 000.

25 Supply connection and external flexible cords Supply connection and external flexible cords shall be as stated in clause **25** of **JIS C 9335-1**.

26 Terminals for external conductors Terminals for external conductors shall be as stated in clause **26** of **JIS C 9335-1**.

27 Provision for earthing Provision for earthing shall be as stated in clause **27** of **JIS C 9335-1**.

28 Screws and connections Screws and connections shall be as stated in clause **28** of **JIS C 9335-1**.

29 Clearances, creepage distances and solid insulation Clearances, creepage distances and solid insulation shall be as stated in clause **29** of **JIS C 9335-1**.

30 Resistance to heat and fire Resistance to heat and fire shall be as stated in clause **30** of **JIS C 9335-1** except as follows.

30.2.3 Not applicable.

31 Resistance to rusting Resistance to rusting shall be as stated in clause **31** of **JIS C 9335-1**.

32 Radiation, toxicity and similar hazards Radiation, toxicity and similar hazards shall be as stated in clause **32** of **JIS C 9335-1**.

Annexes

The annexes of A to O in **JIS C 9335-1** and annex 1 are applicable except as follows.

Annex C (normative) **Ageing test on motors**

Modification:

The value of p in table C.1 is 2 000.

Annex AA (normative) **Rinsing agent**

The composition of the rinsing agent is extracted from **IEC 60436** and is as follows:

Substance	Parts by mass %
Plurafac LF 221 ¹⁾	15.0
Cumene sulfonate (40 % solution)	11.5
Citric acid (anhydrous)	3.0
Deionized water	70.5

The rinsing agent has the following properties:

- viscosity, 17 mPa·s
- pH, 2.2 (1 % in water)

NOTE : Any commercially available rinsing agent may be used, but if there is any doubt with regards to the test results, this composition is to be used.

1) Plurafac LF 221 is the trade name of a product supplied by BASF. This information is given for the convenience of users of the International Standard and does not constitute an endorsement by **IEC** and **JIS** of this product.

Annex 1 (informative)

Comparison table between JIS and corresponding International Standard

JIS C 9335-2-4 : 2004 <i>Household and similar electrical appliances—Safety—Part 2-4: Particular requirements for spin extractors</i>				IEC 60335-2-4 : 2002 <i>Household and similar electrical appliances—Safety—Part 2-4: Particular requirements for spin extractors</i>			
(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between JIS and the International Standard by clause Location of deviation: text, annex Indication method: dotted underlines		(V) Justification for the technical deviation and future measures
Clause	Content		Clause	Content	Classification by clause	Detail of technical deviation	
1 Scope	Safety of electric spin extractors for household or similar purposes that have a capacity not exceeding 10 kg and a drum peripheral speed not exceeding 50 m/s, their rated voltages being not more than 250 V for single phase appliances and 480 V for other appliances	IEC 60335-2-4	1	Identical with JIS.	IDT	—	
2 Normative references	Normative references for text IEC 60436, JIS C 9811	IEC 60335-2-4	2	IEC Standard is cited. IEC 60436	MOD/ addition	JIS C 9811 is added.	Because JIS C 9811 is cited in 3.1.9 for the deviation of test textile.

(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between JIS and the International Standard by clause Location of deviation: text, annex Indication method: dotted underlines		(V) Justification for the technical deviation and future measures
Clause	Content		Clause	Content	Classification by clause	Detail of technical deviation	
3 Definitions	Definitions of normal operation, brake mechanism, double-lid structure	IEC 60335-2-4	3	Normal operation	MOD/ addition	3.1.9 Normal operation The test textile material specified in JIS C 9811 is made also applicable. 3.101 Definition of brake mechanism is added. 3.102 Definition of double-lid structure is added.	Deviation (introduction of test textile material of JIS C 9811) is introduced in 3.1.9 . Such deviation is under proposal to IEC . JIS added some deviations in clauses 18 and 20 , to make such deviations clear, associated definitions were added in 3.101 and 3.102 .
4 General requirement	Safety rules	IEC 60335-2-4	4	Identical with JIS .	IDT	—	
5 General conditions for the tests	Test sequence, types of extractors	IEC 60335-2-4	5	Identical with JIS .	IDT	—	
6 Classification	6.1 As for classification by protection against electric shock, class 0I or better is required. 6.2 IPX4 or better is required.	IEC 60335-2-4	6	6.1 As for classification by protection against electric shock, class I or better is required. 6.2 Identical with JIS .	MOD/ addition	JIS approves class 0I appliance.	Approval of class 0I appliances is because of the circumstances of power distribution system in Japan (without earthing in a plug socket).

(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between JIS and the International Standard by clause Location of deviation: text, annex Indication method: dotted underlines		(V) Justification for the technical deviation and future measures
Clause	Content		Clause	Content	Classification by clause	Detail of technical deviation	
7 Marking and instructions	Marking of "off position" and information to be entered in instruction manual and label such as "maximum mass of dry cloth".	IEC 60335-2-4	7	Identical with JIS. If the off position is only indicated by letters, the word "off" shall be used.	MOD/ addition	In JIS Japanese Kanji character denoting "off" is permitted.	In JIS Japanese Kanji character denoting "off" is permitted.
8 Protection against access to live parts	Inspection by means of test finger and test pin.	IEC 60335-2-4	8	Identical with JIS. However, for appliances not exceeding 40 kg in mass, check is also made on the bottom face with the appliance being tilted.	MOD/ addition	In JIS, the specimen is not tilted in such a case that the extractor is stationary type and used with washing machine (fully automatic or two-drum type) and exceeds 40 kg when water of the maximum designed amount is filled in the washing drum.	In normal operation, a stationary washing machine which stores water in its drum is not tilted otherwise the water will spill out. For problems when IEC specification is applied, see JIS C 9335-2-7.
9 Starting of motor-operated appliances	Not applicable.	IEC 60335-2-4	9	Identical with JIS.	IDT	—	
10 Power input and current	Allowable differences between measured values and indicated values for rated power input or rated current.	IEC 60335-2-4	10	Identical with JIS.	IDT	—	

(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between JIS and the International Standard by clause Location of deviation: text, annex Indication method: dotted underlines		(V) Justification for the technical deviation and future measures
Clause	Content		Clause	Content	Classification by clause	Detail of technical deviation	
11 Heating	Set up conditions, duration of test and points of temperature measurement are specified.	IEC 60335-2-4	11	Identical with JIS except as follows: The duration of test for extractors used with washing machine (full automatic or two-drum type) is not clear.	MOD/ addition	JIS decided that the duration (cyclic) of test for extractors used with washing machine (full automatic or two-drum type) shall follow the standard for washing machine (JIS C 9335-2-7).	JIS clearly specified the test for such appliance (combined ones) exists. Proposal to IEC for such separate treatment is under consideration.
12 Void	Void	IEC 60335-2-4	12	Identical with JIS .	IDT	—	
13 Leakage current and electric strength at operating temperature	Tests for leakage current and electric strength under operating state	IEC 60335-2-4	13	Identical with JIS .	IDT	—	
14 Transient overvoltages	Alternative test by means of impulse test for the parts where the predetermined value of clearance is not satisfied	IEC 60335-2-4	14	Identical with JIS .	IDT	—	
15 Moisture resistance	IP test, water spillage test and moisture resistance test	IEC 60335-2-4	15	Identical with JIS .	IDT	—	

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Clause	Content		Clause	Content	Classification by clause	Detail of technical deviation	
16 Leakage current and electric strength	Evaluation of insulation after moisture resistance test	IEC 60335-2-4	16	Identical with JIS .	IDT	—	
17 Overload protection of transformers and associated circuits	Temperature test in which overload or short-circuit state of transformer is simulated.	IEC 60335-2-4	17	Identical with JIS .	IDT	—	
18 Endurance	Endurance test of braking mechanisms and lid interlocks Operation at rated voltage is carried out — 6 000 times for appliances with maximum peripheral speed not exceeding 20 m/s; — 10 000 times for appliances with maximum peripheral speed exceeding 20 m/s but not exceeding 30 m/s.	IEC 60335-2-4	18	Endurance test of braking mechanisms and lid interlocks Operation at rated voltage $\times 1.06$ — 3 500 times for single drum type; — 1 000 times for double drum type.	MOD/alteration	In JIS • It is clearly stated that this is the requirement for braking mechanism to comply with 20.104 . • The test voltage is defined as the rated voltage. • The number of tests is specified for every maximum peripheral speed and increased from that of IEC . • The test criteria (compliance with clause 20) are made clear.	The number of tests in endurance test of IEC is considered too small based on the actual service conditions (in Japan opening of lid during rotation of double-drum appliance is assumed more often than the assumption of IEC) and a proposal submitted to IEC from Germany says 6 000 tests at the rated voltage. JIS utilized this German proposal and added 10 000 tests for appliances with higher peripheral speeds (such requirements are equivalent to those stated in Clause 1 of Ministerial Ordinance).

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Clause	Content		Clause	Content	Classification by clause	Detail of technical deviation	
19 Abnormal operation	Failure of electronic components and others	IEC 60335-2-4	19	Identical with JIS .	IDT	—	
20 Stability and mechanical hazards	Requirements for stability and lid interlocks of appliances. Appliances with maximum peripheral speeds exceeding those stated below are required to provide lid interlocks, and other appliances are required to provide braking mechanism. — 30 m/s for incorporated spin extractors or separate spin extractors having double-lid structure, with vertical drum axis; — 20 m/s for other spin extractors Further, stopping time by the brake is specified for double-lid appliance.	IEC 60335-2-4	20	Identical with JIS for fully automatic washing machine. Other appliances with a maximum peripheral speed exceeding 20 m/s are required to be provided lid interlocks and those with other speed are required to be provided braking mechanism. Stopping time by the braking mechanism is not specified.	MOD/alteration	JIS applied lid interlock system to extractors other than fully automatic one with vertical drum axis which has double-lid structure when the maximum peripheral speed exceeds 30 m/s, and braking mechanism (including requirement for stopping time) when it does not exceed 30 m/s.	As regards two-drum washers (maximum peripheral speed is normally 20 m/s to 30 m/s), application of lid interlocks (lid does not open until stop of drum rotation) is difficult from the view point of service efficiency. Safety is covered by strengthening the reliability test of double-lid + braking mechanism (see clause 18). The present deviation was submitted to IEC as a proposal but did not accepted, therefore draft of modification is under consideration again. If this Japanese proposal is adopted by IEC , the deviation stated in present JIS will be replaced by this proposal.

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Clause	Content		Clause	Content	Classification by clause	Detail of technical deviation	
21 Mechanical strength	Mechanical strength of enclosure and lid When the lid is made of resin and a caution "not to give strong shock to the lid" is described in the instruction manual, the lid shall not be damaged to the extent that moving parts become accessible after application of static load by means of 20 kg cylinder to the centre of lid.	IEC 60335-2-4	21	Identical with JIS except strength test of lid. A weight of 20 kg is mass is dropped onto the centre of lid from a height of 10 cm, three times.	MOD/ alteration	JIS requires execution of static load test for the lid assuming that something is laid on the lid, and IEC applies drop test assuming that a child plays on it.	When the lid is altered to a strong but heavy one assuming that a child plays on a light plastic lid of washing machine, users may get their hand caught in the lid by closing or may get tired because of the washing. To avoid such inconvenience, JIS altered the assumption to "place a thing on the lid". Proposal to IEC is under consideration.
22 Construction	Construction in general and construction of lid interlocks	IEC 60335-2-4	22	Identical with JIS .	IDT	—	
23 Internal wiring	Curve dielectric strength, etc. of internal wiring	IEC 60335-2-4	23	Identical with JIS .	IDT	—	
24 Components	Number of cycles of operation for programmers is 10 000	IEC 60335-2-4	24	Identical with JIS .	IDT	—	

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25 Supply connection and external flexible cords	Kinds, sectional area, etc. of supply cords	IEC 60335-2-4	25	Identical with JIS .	IDT	—	
26 Terminals for external conductors	Prevention of loosening, sizes, etc. of terminal screws	IEC 60335-2-4	26	Identical with JIS .	IDT	—	
27 Provision for earthing	Prevention of loosening and corrosion of earthing wire, earthing continuity test, etc.	IEC 60335-2-4	27	Identical with JIS .	IDT	—	
28 Screws and connections	Endurance, kinds, prevention of loosening of screws, etc.	IEC 60335-2-4	28	Identical with JIS .	IDT	—	
29 Clearances, creepage distances and solid insulation	Clearances, creepage distances and thickness of solid insulation	IEC 60335-2-4	29	Identical with JIS .	IDT	—	
30 Resistance to heat and fire	Ball pressure test, glow-wire test and needle-flame test	IEC 60335-2-4	30	Identical with JIS .	IDT	—	
31 Resistance to rusting	Protective means against corrosion	IEC 60335-2-4	31	Identical with JIS .	IDT	—	

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Clause	Content		Clause	Content	Classification by clause	Detail of technical deviation	
32 Radiation, toxicity and similar hazards	Not specially specified.	IEC 60335-2-4	32	Identical with JIS .	IDT	—	
Annexes	As specified in JIS C 9335-1 .	IEC 60335-2-4	Annexes	Identical with JIS .	IDT	—	
Annex AA	Rinsing agent	IEC 60335-2-4	Annex AA	Identical with JIS .	IDT	—	There is no technical difference, but such caution that JIS also does not endorse particular products is added.

Designated degree of correspondence between **JIS** and International Standard: MOD

Remarks 1 Symbols in sub-columns of classification by clause in the above table indicate as follows:

- IDT: Identical in technical contents.
- MOD/addition: Adds specification item(s) or content(s) not included in International Standard.
- MOD/alteration: Alters the specification content(s) included in International Standard.

2 Symbol in column of designated degree of correspondence between **JIS** and International Standard in the above table indicates as follows:

- MOD: Modifies International Standard.

Reference standards

The reference standards in **JIS C 9335-1** are applicable except as follows:

Addition:

IEC 60436 *Methods for measuring the performance of electric dishwashers*

Errata for JIS (English edition) are printed in *Standardization Journal*, published monthly by the Japanese Standards Association, and also provided to subscribers of JIS (English edition) in *Monthly Information*.

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